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ABSTRACT

The analyses required for the design of an integrated record-keeping system in a history museum and the steps required to implement such a system are presented. The analyses include an examination of the management philosophy; the activities within the museum which require written records and the various data files desirable to support these activities; the process of identifying, defining, and controlling data categories which must appear in the museum's files; and the design of interrelated files. The implementation steps include the design of forms for recording data; the creation and specification of rules to control the flow of information and the museum-wide management of the record system; selection of a computer system, if one is to be used; and design of a versatile report system to facilitate the actual use of the data records. The analysis is worthwhile even if no contemplated use of computers is foreseen. (Author/MBR)

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MUSEUM DATA BANK RESEARCH REPORT

Number 11

An Information System

for

History Museums

by

Carole E. Rush

April 1977

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Carole E. Rush

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

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Museum Data Bank Committee
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IR000666

Until fairly recently history museums have lagged considerably behind other organizations in the application of computer technology to meet their record-keeping and data-organizing needs. In museum fields where the use of a computer has shown immediate advantages, the progress has been more rapid. For example, science museums have the advantage of a defined terminology (the Linnaean system of nomenclature) which facilitates consistent communication about biological specimens; art museums, whose objects are usually identified by artist and title, have been spurred on by the need to locate appropriate art objects in other museums for exhibit purposes; and archaeology museums have needed computers to facilitate management of information about large numbers of objects and sites. History museums, however, have not had as much specific need to communicate in a structured way with other history museums; and they have suffered from both the lack of a consistent terminology to describe man-made objects and the lack of a well-defined methodology for cataloging information about the objects.[1]

Computer technology can be of significant value within history museums. However, the use of a computer demands a precision that often is unfamiliar to most history museum personnel. It requires a thorough examination of present and future museum activities, of the demands made upon the museum's record system, of the current state of the museum's records, and of the goals the museum has for its proposed record system. In addition, the use of computer techniques will usually necessitate an improvement -- in some cases, a major improvement -- in the consistency of history museum cataloging methods.

This paper is both an exploration of the impact of computer technology on the record-keeping practices of history museums and an exposition of the analyses which are necessary prerequisites to any satisfactory use of computers. However, even if there is no contemplated use of a computer in the near future, the analyses of a museum's information needs which are necessary for a computer system are nevertheless worthwhile. The topics discussed here are the analyses required for the design of an integrated record-keeping system and the steps required to implement such a system.

The analysis phase includes an examination of

1. the management philosophy which is essential to the creation of a museum-wide record system;

2. the activities within a museum which require written records, and the various data files which are desirable to support these activities;

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1. For elaboration on this idea see Swinney, H. J.: Characteristics of History Museum Activity and their Influence on Potential Electronic Cataloging (Museum Data Bank Research Report #8. Rochester, New York: Museum Data Bank Committee)

3. the process of identifying, defining, and controlling data categories which must appear in the museum's files; and

4. the design of interrelated files.

The application phase includes an examination of

1. the design of forms for recording data;

2. the creation and specification of rules to control the flow of information and the museum-wide management of the record system;

3. the selection of a computer system if one is to be used; and

4. the design of a versatile report system to facilitate the actual use of the data records.

Definitions of some of the terms used in this paper are necessary for an understanding of the concepts presented. The process of creating a record-keeping system requires the systematic organization and recording of all observations which are pertinent for a thorough description of a group of people, places, things, events or ideas -- the entities which are the focus of the description. A data category[2] is defined as a standardized frame within which is expressed an observation about or classification of the focal entity according to an attribute that is distinct from all other attributes. The content of a data category is the actual descriptive information. A record is an organized collection of observations, recorded in data categories, presumably containing all pertinent information necessary to describe the entity. A file is a collection of related records. A pointer is a logical connector between separate records, which may be in the same or different files. An integrated record-keeping system is an information system with interrelated data files, either manual or computerized, in which each file contains records using (1) a well-defined and delimited set of data categories which are pertinent to that particular file and (2) carefully controlled pointers to data in other files.

For example, the focus of an accessions file is information concerning the accession of the objects in the museum's collection. The file encompasses data on all accessions; each record describes one accession; and each data category covers one descriptive attribute of a single accession. A separate file might encompass all of the museum's collections data with each record as a description for one object in the collection. Depending upon the museum's decisions concerning what data to record in what file, a pointer from an object record to

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2. Following the accepted practice in museums, the term, data category, is used here to refer to the concept computer scientists call a data element.

an accessions record might be constructed either from the object Registration Number or from an Accession Number (if the museum assigns such a number as distinct from a specific Registration Number). Thus the accessions file and object collections file would be part of an integrated system.

The Margaret Woodbury Strong Museum in Rochester, N.Y. is used to illustrate various points in the paper. The Strong Museum is currently in the formative stages. When it opens to the public, presumably about 1982, it will be a museum depicting the social and cultural development of northeastern America during the post-industrial era -- roughly 1820 to 1930.

ANALYSIS PHASE

Management Commitment

A fundamental requirement for success in the creation of a controlled museum record system -- either from the onset (as in the case of the Strong Museum) or as a revision of an existing record system -- is a firm commitment on the part of the director and the trustees to take whatever steps are necessary to bring the project to a successful conclusion. The analysis necessary to structure the museum records with the required precision demands a commitment of both time and resources. In addition, there must be a willingness to be innovative and, perhaps, non-traditional in terms of record-keeping techniques.

Time is the primary requisite in the creation of an integrated record-keeping system. The overall museum objectives and needs must be thoroughly examined in order to define the records that must be created and the elements of information which must be entered into each record. Each segment of descriptive information in each file must be defined and rules for recording that segment must be developed. This demands long-term support and both patience and a willingness on the part of each person involved (the director, the curators, the registrar, the data system analyst, the data entry clerk, the users of the files) to take the trouble to be precise and accurate in every aspect of the work. There is a continual requirement for cooperation, flexibility and compromise among all the people involved because the process requires defining record system rules, testing the rules, revising the rules to more accurately meet the specified requirements, and testing again until each information file meets the specifications. This is a slow process because it usually requires changes in old methods of record keeping and, more importantly, changes in old ways of thinking. Time for both reflection and revision are absolute requirements.

From the beginning the director of the Strong Museum has had a firm commitment to the use of the most advanced technology to create an integrated, museum-wide record system. The organization began in 1972 with a personal collection of more than 300,000 undocumented objects, largely in the decorative arts of the nineteenth century, left for museum purposes by the late Margaret Woodbury Strong, who died in 1969. The need for systematic records has been evident from the beginning. Funds were available to enable the museum management to consider seriously the use of a computer in the creation and control of records. Since this is a new museum, all personnel have arrived with a commitment to utilize modern computer methods for the creation of a well-organized record system.

Analysis of Museum Activities

The first step in designing an integrated record system is to analyse the activities of the museum and the needs that exist for various record files. In this paper, we will examine only those activities which are related to the collections; but accounting, payroll, personnel, and security sub-systems could and should be examined in the same way.

Activities that involve museum collections may be conveniently grouped into three categories (see Figure 1).[3] Each museum will have its own unique set of subactivities within each of these categories. However, the three major categories of activities are applicable for all museums.

Initial Activities. When an artifact or specimen is first acquired, a number of things happen. The object must be accessioned, registered, identified and, possibly, restored. In some museums a photograph is also made as a routine part of these "Initial Activities."

Ongoing Activities. Once the first surge of activities has been completed, most museum objects rest in storage until they are needed for a research project or for an exhibit, either at home or (on loan) in some other museum, or unless a deterioration in the condition of the object requires some conservation effort. Museum management also needs to have information for ongoing collections management activities such as inventory evaluation, location, current status, etc. It is these "Ongoing Activities" which are the essential business of a museum. The purpose of all of the initial activities is simply to make the ongoing activities possible.

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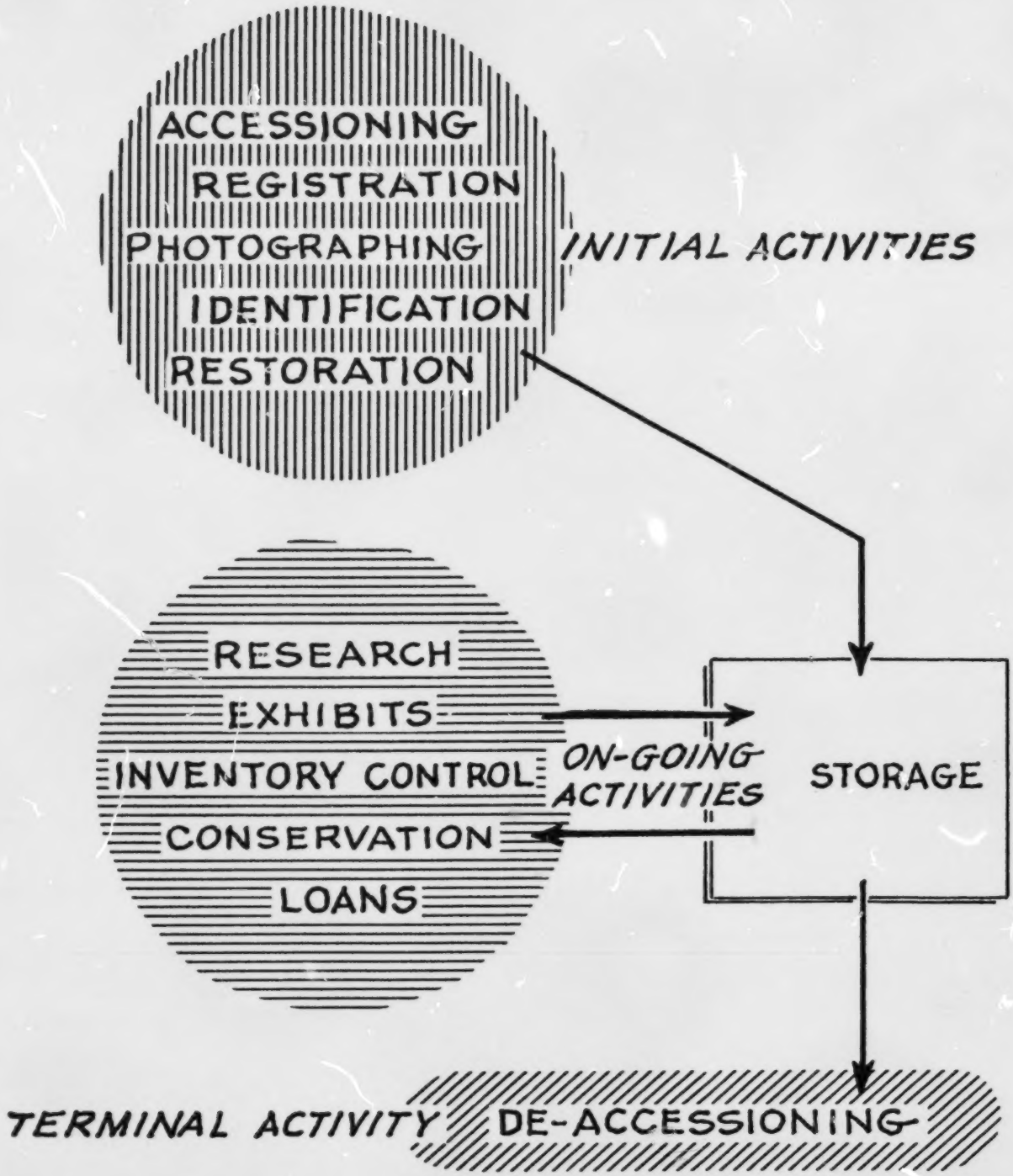
3. Adapted from Chenhall, Robert G.: The Onomastic Octopus (Museum Data Bank Research Report #10. Rochester, New York: Museum Data Bank Committee)

Fig. 1. MUSEUM ACTIVITIES REQUIRING AN INTEGRATED RECORD-KEEPING SYSTEM.



Terminal Activity. Eventually -- which may mean a very long time -- practically all museum objects are disposed of in one way or another. The "Terminal Activity" of de-accessioning must be mentioned in order to make the cycle complete. However, it is the ongoing activities of the museum that are important.

When each sub-system and the key activities which comprise that sub-system have been defined, the next step in the analysis of an information system is to develop a clear and precise statement of what is needed in order for those activities to be performed most efficiently. "What is needed" always boils down to having all of the information required for each defined activity available at the right time and place for the person who is to perform the activity, and accomplishing this as cheaply as possible.

Specification of Required Files

After examining the activities of the museum, it is possible to define various data files which are necessary to meet the ongoing needs of the museum. Keep in mind that these files can be any desirable combination of manual and computerized files; however, that decision is not important at this stage. What is important is that those involved in the analysis understand how the various files relate to each other and how each file might be accessed. Some files that can be useful in a history museum are:

1. An Accessions File -- legal acquisition information about the objects
2. An Object Catalog File -- descriptive data about the objects in the museum's collections
3. A Source File -- information about each donor, vendor or lender of museum objects
4. A Loans/Exhibits File -- records concerning specific objects on loan or on exhibit
5. A Collection Photograph File -- a photographic record of each object, together with basic data concerning the photograph
6. An Inventory File -- financial and locational data on each object
7. A Conservation File -- conservation data on each object
8. A Research File -- research records and/or historical photographs organized by theme

9. A Library File -- a library catalog organized by subject

10. A Disposition File -- data about the deaccessioning of objects

This list is intended only as an example of the types of files a museum might have. It is not intended as an absolute. Any museum might have a different configuration of files. Even within this sample list, several files could be combined into one, or the larger files could be separated into segments.

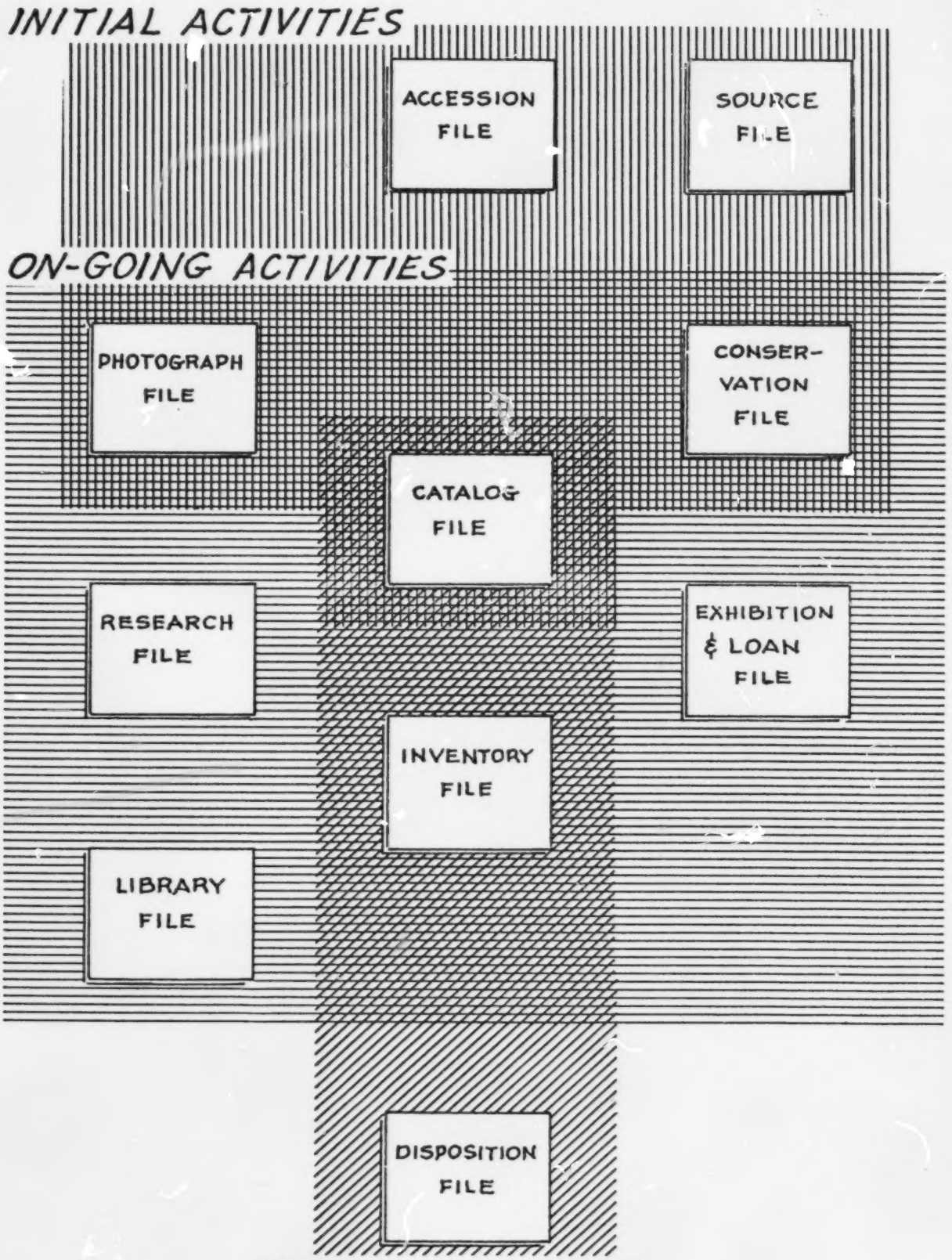
An initial diagram of such a record system could be as shown in Figure 2. As the museum needs are more closely defined, and later as specific data elements necessary for each file are specified, the connections among the files will be indicated. Once the interrelationships among the files are specified, it is possible to visualize how various files might be used together or even combined if it is probable that the information recorded in more than one file will regularly be required in order to perform any ongoing activity.

Determination of Data Categories

Once the files are defined, it is necessary to determine (i.e., to identify and define) the categories of data which must be contained within each file. Identification and definition of data categories are closely related but separate processes. First, it must be determined what information is required in a particular record, based upon the purpose the record is to serve. The various elements of that information can then be identified and separated into various data categories. Each data category must then be defined in precise, unambiguous terms that enable one to distinguish it from all other categories.

In the discussion which follows, an assumption is made that every pertinent data category for all files must be recorded in at least one place; but informational categories, other than those required to cross-reference the files, should be recorded only once. In an integrated record system, the content of any data category can serve as a pointer to some other file in which additional pertinent information exists. There are advantages in terms of time, accuracy and economy in recording data in as few places as possible. Yet the users of the museum's records should have all of the necessary information at hand to meet the ongoing museum needs with efficiency. Data categories that are always needed together should be recorded in a way that will make them available together. The final configuration of the integrated record system will determine whether data can easily be located in another file with minimum effort by the record system user. There will often be a tradeoff in the economy of recording and correcting data only once in the most appropriate file versus the difficulties that might face the user when trying to combine data from separate files. As a general rule, if (1) a data category is not regularly required to

Fig. 2. INTEGRATED RECORD SYSTEM FILES



perform the primary activities which the file in question is designed to serve and (2) it is available in another accessible file, then the information should not be duplicated in both files.

In the specification of data categories required for any particular data file one should always keep in mind these questions: Who needs to use this file? What data categories are essential in this file? What additional data categories are desirable to facilitate accurate communication? What other museum records are related to this data category? How is this data category uniquely separable from other data categories?

For example, if one is defining the data categories necessary for an accessions file, answers to the questions are not hard to establish. The registrar, the chief curator and the controller need information from the file. Necessary data categories are 1) date of accession, 2) source of the accession (e.g., donor, vendor, etc.), 3) value of the accession, 4) number of objects contained in the accession, and 5) a brief description of each object. Whether the Registration Number for each object in the accession is recorded in the accessions file will be determined by the ease of access to this information in other files. It is not necessary to record the address of the source in the accessions file if records are maintained on each donor/vendor in a separate file which is readily available. The thoroughness of the description of the accession is dictated by the availability of access to the object catalog and other records.

The most complex file pertaining to object collections is the object catalog file. In the process of determining all possible data categories that should be available for the cataloging of man-made objects, all classes of objects in the museum must be considered. For accurate cataloging different subcollections of objects often require different subsets (i.e., combinations of some, though not necessarily all) of the data categories. For example, the data category, TITLE, is necessary for the curator of art but usually meaningless to the curator of dolls. At the later stage of data recording, catalogers should be encouraged to use only those data categories which are necessary to describe the particular subcollection of objects in hand. But at first the person creating the system must ask: What data are required to meet each of the ongoing activities of the museum for all types of objects? Are the required data available? How can each data category be separated from all other categories? And perhaps, how might the interpretation of each data category vary from one subcollection to another?

The type of object collections and the needs of the specific museum are the important factors in determining what data categories should be used for the object catalog. For example, the examination of the needs that one hypothetical museum has for its object catalog file might lead to the determination that the following information is necessary:

1. For object identification: Registration Number, Classification, and Object Name;

2. For recording an object's physical description: Style, Material/Technique, Inscription, General Description, Dimensions, and Condition;

3. For recording the history of the object: Manufacturer, Artist, Earliest Date, Latest Date, Period, Exhibition History, Provenance, Identification Source, Associations, Country of Origin, etc.

4. For identifying objects for exhibits or loan: Theme Represented and Subject Represented;

5. For object inventory control: Accession Identification, Value, Location, and General Status.

Once the necessary data categories have been identified, the analyst can finalize the definitions of each category. Precision of definition is extremely important so that both the people who record the data and the people who use the data understand exactly what attribute of information is included within a given data category. For example, does Subject Represented encompass every element pictured in a painting or does it only include an actual person or place? Any variations in interpretation of a data category from one subcollection to another should also be considered. Data categories should represent completely distinct data attributes so that both the name assigned to a particular data category and the content of that data category will communicate information: i.e., the name of the category should alert the user to what attribute of information is being described and the content is the specific information recorded.

Control of Data Categories

Closely related to defining the meaning of each data category are establishing the format for the data content and delimiting the actual content words. Format means the structure and rules used for data recording: the order of words, the number of characters which are required or which will be allowed, the division of segments, the use of upper or lower case letters, the use of singular or plural, the meaning of special characters, etc. For a simple example, the format of a date is the specificed structure to be used for recording a date -- such as year-month-day, with a four-digit year, a two-digit month, a two-digit day, and a slash to separate each segment (e.g., 1892/03/30).

In delimiting the content that is to be recorded within each data category, one should consider the question, "Is this data category to be used as a descriptor term for indexing (or sorting), or will free-text be acceptable?" Free-text data categories are those which are used to complete the description of an object but which will not be used for indexing. The content of free-text categories does not need to be controlled except in a general way. However, the process is more complex for descriptor data categories that will be used for

indexing. In descriptor categories it is necessary to have an authority file -- a controlled list of acceptable descriptor words -- which must always be used when recording data in a particular data category. The order of multi-word phrases is also quite important if the final file is to be created on a computer. The computer does not have any intelligent means of sorting words and cannot make all the decisions that people make when searching a manual file. For example, a computer would index "Mechanical toy" and "MECHANICAL TOY" and "Toy, Mechanical" in completely separate locations, whereas a person might decide that records for all these items should be filed in the same place.

For some data categories it is quite simple to locate or to develop an authority file. For example, there are a relatively limited and identifiable number of Style names that apply to furniture. And a controlled list of terms to use for Material/Technique can be developed by curators of art work. For any data category that requires an authority file for content control, it is important to record in the museum's copy of that authority file any revisions (additions or corrections) that have been made so that everyone concerned with access to that data category can understand the up-to-date rules and limitations that apply when cataloging or searching the catalog.

The most serious problem for history museums has been the lack of an authority file for the classification and naming of man-made artifacts. The English language often has many different words which are considered acceptable names for the same object. People involved in the naming of objects for catalogs usually use whatever name they consider most appropriate at a given time. This leads to many inconsistencies in the words used for naming objects even within one file in a single museum, so that data retrieval becomes complicated and uncertain, no matter whether the file is managed manually or in a computer. Consistency in the use of our inherently inconsistent language is an extremely difficult problem.

From the onset, the management of the Strong Museum recognized the need for an authority file for the classification and naming of the objects in the museum. With support from the National Endowment for the Arts and with the generous help of experts in other history museums, such an authority file or lexicon has been developed at the Strong Museum. Nomenclature for Museum Catalogs: A System for Classifying Man-Made Objects is being published by the American Association for State and Local History, 1400 Eigth Avenue South, Nashville, TN 37203. It is expected to be available in late 1977. The book will include a rationale for the categorization and classification of man-made objects and also a lexicon of object names.

The process of accurately defining each data category for a given file is a vitally important step in the design of the record system for a museum. It does not matter whether the file under consideration is to be a manual or a computer file. The determination and then the defining of the data categories always leads to more accurate communication within the museum because users of the

files are able to understand the record content and to rely upon consistent data. The well-understood conventions of bibliographic entry and scholarly citation of printed works are just one example of defined data entry, and their utility is self-evident.

Design of File Relations

The analysis of the entire system should lead to answers to questions such as: What data files are needed? How should the files be separated? Which files are used together frequently so that they could be integrated? Which files must be interrelated and what data categories can be used to relate them? In an integrated record system there must be some pointer from the records in one file to the records in another file. This is true for any combination of manual and computerized files. Quite often the pointer will be derived from the content of a specific data category. For example, one common data category in the object catalog file is the Registration Number. From any record where it exists, this number can be used as an entry point into any other file that is indexed by the same number: e.g., from the photographic file which is arranged by Subject into a master catalog file indexed by Registration Number. Also the content of the data category, Theme, might be an appropriate entry into a library or a research file which is sorted by Subject. See Figure 3 for one possible integrated system design.

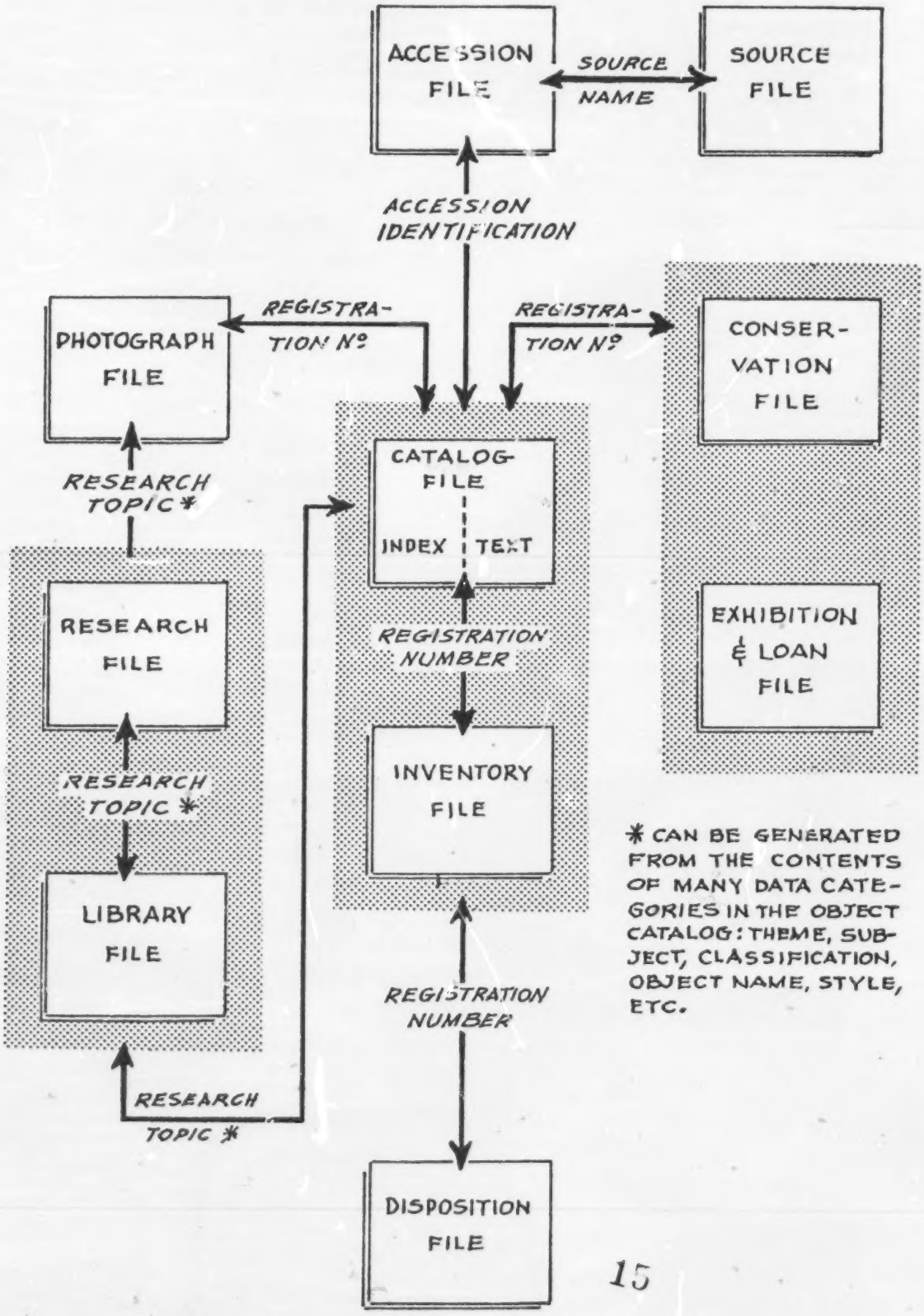
Documentation

The final part of the analysis phase is to document the decisions that have been made and the information that has been gathered thus far. The documentation should include a description of the museum activities under consideration, the people involved in each activity, and the data requirements to support those activities; the files that are needed to meet the museum's needs; the data categories needed for each file along with their definitions and formats; the authority files to be used for various data categories; the relationships among various files, and specifications for data pointers to connect the files. The documentation which relates to specific data categories within a file should be combined into a documentation manual for that file. This manual will be expanded to include application procedures which are determined during the next phase of the system development. Understanding can be achieved more accurately and more easily through written documentation than by verbal communication. Even with the written documentation, care must always be taken to communicate in a precise and unambiguous manner.

System Reevaluation

One word of warning at this point. It would be ideal to be able all at one time to examine all museum record-keeping needs, specify necessary files, determine what data are needed, define the data categories precisely and

Fig. 3. FILE INTERRELATIONSHIPS IN AN INTEGRATED RECORD SYSTEM.



unambiguously, specify authority files for the control of data categories, document the system completely, and, furthermore, to make no mistakes in the process. This, however, is rarely or never possible. The steps in the process always overlap, and it is impossible to suspend all museum operations until the analysis is complete and the rules immutable. There will of necessity be some backstepping and revamping of the system. Users of the records, from the museum management to the curators to the public, will provide valuable input concerning whether the system actually meets their needs. Redesign of various aspects is often necessary. The reevaluation process, though often frustrating, is a desirable and even necessary part of the development of an information system in a museum. Unfortunately we learn much more quickly from our mistakes than we do from instant success.

As an example of the redefinition process in the Strong Museum we have gradually developed an authority file for a data category we call Theme. It began as a data category called Subject and rapidly became a catchall for every possible generic subject as well as proper noun subjects depicted on an object (e.g., "nature", "bumblebee" and "George Washington" could have been listed as subjects of a portrait of Washington with a nature scene as background). It quickly became apparent that Subject was inadequately defined, could not be controlled, and had little utility as it was being used in our catalog record. Therefore, this data category was divided into two separate data categories: Subject and Theme. During the redesign, we had several meetings of the curatorial staff to discuss what everyone really needed from these two data categories. In the process of developing an authority file for Theme, we had to expand our ideas into a more global and less specialized view of the museum. We also had to confront questions such as, "How detailed should the catalog records be?" and "How can we unify diverse subcollections in a way valuable to the entire museum?" The list of themes still occasionally requires revision, but it has become a very useful authority file for the Strong Museum. The process illustrated to all of us the need for cooperation and compromise in order to achieve an acceptable and useful solution to a problem.

APPLICATION PHASE

Once the analysis phase necessary to create an information system has been completed, ideas and plans can be converted into concrete results. How will the actual information needed for museum operations be gathered? Who will gather what information? How will the information be recorded? How many steps are there in the recording process? What tools can be designed to aid in the process? And what is to be the final form of each file (i.e., manual or computerized)? All these questions are interrelated.

Design of Input Forms

After the data categories necessary for an object description have been determined, they must be organized on an input form or record. Elements which

have a special impact on the design of the form are: What special recording rules must be followed? How will data be transferred to the final catalog record? What data categories relate closely to each other? Should the form cover data categories for only one file or for several? How can the data be corrected at some later time? What will be the ultimate disposition of the initial input form?

The final form of the file influences some of the decisions. For example, the decision to create a computer file usually leads to a recording rule of brevity and the avoidance of repeating information in more than one data category. At the Strong Museum we have discovered this to be one of the most difficult recording rules to follow. Our curators feel we have taken away their poetic license by requesting brevity. Figure 4 shows some general recording rules we have specified. We also found at the Strong Museum that a catalog worksheet (Figure 5) which groups the most common descriptor data categories together and in close proximity to the free-text Description category eliminates many concerns the curators had about not being allowed to repeat information. This may be a good rule for any input form. On the positive side, all curators have seen the benefit and even begun to enjoy being able to rely upon specified authority files for particular data categories. An enthusiastic attitude can lead to a helpful interchange of ideas among all people involved in the design process.

Information Flow

By specifying the paths along which information forms will travel, the system analyst attempts to control the various stages in the cataloging process. At the Strong Museum, the curators record the information on the catalog worksheet which then goes to a data entry clerk for creation of a computer record. After it is recorded, the catalog worksheet is returned to the curator for proofreading of the typed computer record. The initial catalog worksheet is ultimately bound and stored by the registrar. During the interim stages of data entry, the curators prefer to keep the catalog worksheets in their possession -- i.e., until they are replaced by completely acceptable computer output. If the initial catalog worksheets are to be the hard-copy records, rules for recording corrections and for manual clarity have to be quite stringent. It is also important to record (or log) the transfer of catalog worksheets from one person to another. A recording system definitely proceeds more smoothly if very clear rules are specified and adhered to concerning the flow of information.

Up to this point in the system analysis the form of the final file has been of relatively minor importance. In actual practice, the final form of the various files may be some combination of manual and computerized files. Possibly only descriptor categories will be entered into a computer file which will serve as a master index. In that case all free-text data categories could be stored in another file that is indexed by Registration Number; or a computer index could provide entry to a master file of all catalog information stored on microfiche and indexed by Registration Number. Regardless of the actual storage

Fig. 4. The MWSM Cataloging Commandments

1. General rules:

   - Be brief
   - Be consistent (i.e., use terms consistently)
   - On every catalog sheet enter
     - a classification term
     - an object name
     - a registration number
     - a Parke-Bernet number (exception: new acquisitions)*
     - an acquisition code (see MWSM 2.21)*
     - the date cataloged
     - your last name and initials (as cataloger)
   - Other data categories are optional; use them only if needed
   - With sets of related items, prepare one catalog sheet for the set; if space permits, record individual items on the reverse side
   - Except for sets, prepare one catalog sheet for every artifact (Suggestion: for duplicate artifacts, make a Xerox copy before recording accession number and condition)

2. With descriptor categories (used for searching):

   - Enter only the exact words you would probably use to search for that record; avoid words which merely describe the object
   - Separate multiple entries within one data category with a triple slash ("///"); do not use any other symbol for this purpose
   - Avoid connective words or symbols (e.g., "and") and articles ("a", "an", "the")
   - Avoid entering the same phrase in more than one data category

3. With free-text categories:

   - Do not repeat information recorded in a descriptor category
   - Record information in short phrases, not complete sentences (We do not give extra credit for literary style)

TO REPEAT - BE BRIEF AND CONSISTENT

* of internal significance to the Strong Museum

Fig. 5

MARGARET WOODBURY STRONG MUSEUM

Classification ... (36)
Object Name ... (32)
Tracing ..... (88)
Association .... (94)

Registration No. .. (6)
Location ..... (62)
Quantity ..... (136)
Jacket File .... (91)

Title ..... (30)

Theme ..... (40)

Subject Repr. ... (38)

Artist/Author ... (70)
Artisan ..... (72)
Mfr./Printer .... (74)
Publisher ..... (73)
Advertiser ..... (71)
Distributor ..... (75)

Style ..... (64)
Period Name .... (80)
Display Date .... (83)
Earliest Date .... (82)
Latest Date .... (84)

Country of Origin (76)
Place of Origin .. (78)

Decorative Motif (42)
Design Layout .. (43)

Material/Technique (48)
Technique Descr. . (46)
Dim. (cm.) ..... (51)

Description .... (35)

Inscription ..... (55)

Condition, Special (163)
Condition, General (63)

Ident. Sources ... (95)

Provenance .... (178)

Exhibition Hist. . (93)

Photographs .... (60) B/W: B- Color: C- Slide: S-

Received	Accessioned	Cataloged	Cataloger (1)

Acquisition:
Method .. (3)
Total cost
Purchase price
By whom
Source ID (106)

Credit Line .. (5)

Restrictions .. (7)

Appraisals (104):	Amount	Date	By Whom

Disposition:
Date
Authority
Method
Value Rcvd.
Recipient

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media used for all files or parts of files, the analysis of the data needs and data relationships will remain valid if it has been adequately carried out. Therefore, changing the form of the files at some future date (i.e., from computer to manual or vice-versa) will not require re-analysis of the needs nor re-recording of the data.

The analysis and application phases for manual files should result in the creation of a final catalog file which can be duplicated, sorted and stored in as many ways as required for usable indices. In the remainder of this paper, we will be more specifically oriented toward the integrated record system which has at least some computerized files. The important aspects of the remaining phases of analysis are the selection of a computer system, the design of files for daily operational use, and the design of a report system.

Selection of a Computer System

In selecting a computer system to implement computerized segments of the designed record-keeping system, keep in mind the uses the museum desires to make of the computer file. Consider the design of connections between computer files as well as pointers to manual files. It is preferable to find a computer system that allows later file expansion and connection of files which were not originally designed together. Start by examining the computing facilities nearby. Consider nearby university computing facilities as well as local consulting groups. Find out about the availability of data management computer systems and advanced software packages. Also, be concerned about the type of consulting support available on the system and to the museum as a user of the computing facility. The use of well-designed prepackaged systems will almost always be less expensive than creating one's own system. The degree of support needed will depend upon whether there is someone on the museum staff who will be in charge of the actual computer work or whether it will all be done outside the museum.

An increasingly viable alternative to a large computing facility is the use of an in-house mini-computer. This rapidly growing technology promises increased software facilities and larger storage capacity and it will undoubtedly have a great impact on costs in the near future. For example, a new desk top computer has recently been introduced which sells for $6200 and has random-access storage of 180,000 data characters. There must, of course, be a trade-off between the advanced capabilities of large data management systems at a relatively high cost and the less sophisticated in-house facilities at a fixed cost. In actual current practice a mini-computer system will most often continue to be integrated with a larger and more powerful computing facility. But the potential of the mini-computer should not be overlooked.

The most important considerations in the selection of a computer system are: the complexity of needs of the museum, the alternative systems available, the

funds allocated to create the computerized file, and the personnel available to monitor the work. A balance can usually be found and a system selected or specifically designed to meet the requirements.

The computer system selected must be capable of meeting the daily needs of the museum. The convenience of using an on-line computer index (one which is available for use at a computer terminal at any time) must be balanced carefully against the costs after considering the types of daily demands that will be made on the system. Quite often the generation of a usable set of reports concerning the collection and various subcollections will be of much greater benefit than an on-line catalog. If it is possible to receive computer output quickly, batch use of a computer system (using a computer without user interaction during the processing of data) is always more economical and is usually satisfactory for most needs even though it seems less glamorous. The system designer should ask: 1) How often do we need the answer to a question right now rather than in several hours?; 2) Are there any standard manual indices that we could use easily in our daily jobs or is a computer query necessary?; and 3) What parts of the catalog record are really necessary in every instance?

One factor that must not be overlooked in making the decisions about what type of computer system to use is the psychology of the user. The user of a record system must be satisfied or even enthusiastic about the results in order to be cooperative. In actuality a computer is a very powerful tool that people can use to make their daily work more productive, and sometimes even more interesting, and should not be viewed as a tool that controls the people. Therefore, removing barriers between the museum user and the computer as a tool is an important process. This can be accomplished by combining on-line terminal usage of a system with well-designed and meaningful reports and manual indices. The concerns and needs of the people who carry out the daily work of the museum must be given foremost emphasis in order for a computer system to be of long-term benefit.

The Strong Museum has available the computing facilities at the University of Rochester Computing Center. Data entry is made into computer files by means of a remote terminal connected through an acoustic coupler and using a text-editor program called WYLBUR. The data management system called INQUIRE (a proprietary software package of Infodata Systems, Inc.) has been selected for the creation of the master catalog file. INQUIRE can be used in a batch or an on-line mode, and support for INQUIRE is available at the Computing Center of the University of Rochester and through the Infodata office in Washington, D.C.

Report System Design

In designing the report system the analyst must be willing to consider the different needs of the separate subcollections. For example, for the doll curator at the Strong Museum, a report sorted by Object Name (i.e., merely

"Doll") would be virtually meaningless, but a report sorted by Manufacturer is essential, as is one sorted by doll Style name. On the other hand, the curator of the Oriental collection needs a report sorted by Object Name. Each curator of a special subcollection will probably need complete catalog information about objects in that subcollection arranged either by Registration Number or in whatever way provides the best access to the information.

In every museum, there should be a master file of all museum objects which is arranged by Registration Number and readily available. In the reporting process do not overlook the need for at least one "hard-copy" (paper or microfiche) master file. A hard copy file is always available whereas a computer sometimes is not, and people still like and often need to use hard-copy files. The advances in microphotography indicate that microfiche files will be even more useful and economical in the future.

SUMMARY

As a summary, we will illustrate the problems and the advantages and future hopes that have resulted from our computer project at the Strong Museum. An immediate concern is the evolving nature of the project. We have been developing some of the authority files and rules as cataloging has proceeded, rather than being able to begin with a completely designed and rule-bound system. It has taken time. The diversity of subcollections at the Strong Museum requires special rules or authority files for each subcollection and also special reports for each. At first, the curators felt that they were duty-bound to fill in every blank space on the catalog worksheet. They also disliked the need for brevity and worried about the need for consistency. These initial concerns have now disappeared as they have gradually realized that only pertinent information is required. Patterns for each subcollection have emerged and rules are being defined and recorded. Cataloging has actually become easier. Another fear has been that the curators might lose control over their subcollections in a centralized and less-individualized system. In actuality, a computer system should provide the curator with additional tools for the management of their special subcollections. Concerns could have been allayed if the report phase of the computer system had been completed very early in the project. Now that reports are beginning to come back, however, some people are thinking happily of ways a computer system can make life simpler by eliminating some of the tedium and freeing time for research.

The prevalent pattern seems to be that we think of more and more ways to use the computer system. In addition to creating a master index for the object catalog on a computer, we are planning to develop "subject" and "theme" links to a computerized library file and also to our historical research files which may or may not eventually be computerized. The registrar has obvious needs for the computer files in order to control our large number of loans, and we are hopeful that carefully designed links to an accessions file and to a source file will eliminate recording redundant information that is already available in the object catalog. The controller needs inventory information for audit records,

for insurance purposes, for security, and for possible object disposition. The exhibits department hopes to use the files for control and development of exhibits and also for generating thousands of labels as well as reports to be used in the open storage areas of the museum. The curators need standard reports for their daily work as well as for their special research projects. It is not likely that any curator will need daily access to the entire object catalog, although that would be possible if microfiche records were used for the object catalog, the library catalog, and possibly for special research files. The clerical advantage of maintaining only one master catalog file, which can be corrected simply and in one location, can be indexed on a number of data categories, and can be used for a variety of purposes, is obvious.

A museum's decision to develop a computerized object catalog should lead to the design of an integrated and consistent record-keeping system with defined procedural rules for achieving the overall objective of the museum. These tasks must be done if the project is to be successful. Success in this can in turn result in accurate and meaningful communciation of historical information internally and, as a result, to the museum public.